

**DICTATING
SYSTEMS**

CONCORD
INDUSTRIAL PRODUCTS DIVISION

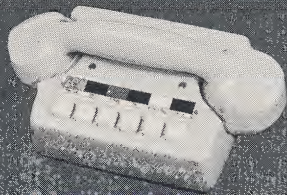
**AUDIO
INSTRUMENTATION**

**CLOSED CIRCUIT
TELEVISION**

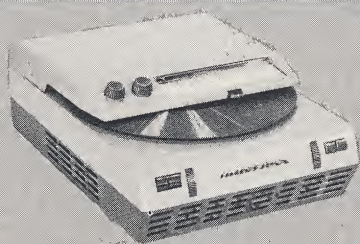
**AUTOMATIC
ANNOUNCING
SYSTEMS**

**MULTICHANNEL
TAPE
RECORDERS**

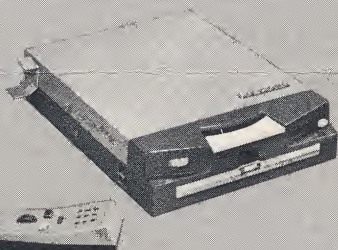
ELECTRONIC COMMUNICATIONS EQUIPMENT



CONCORD UNIVERSA



CONCORD MARK I



DICTATING EQUIPMENT

Concord Dictating Systems are designed to provide the advantages of centralized dictation, to both small and large offices, with maximum efficiency and economy. The Concord Intel Centralized Dictation System utilizes the Concord Universa dictating machine, the only dictating machine specifically designed and manufactured to meet the specialized requirements of centralized dictating systems.

The Concord Mark I dictating machine is a new, light weight and compact unit designed for use and applications where the amount or nature of the dictation may require an individual desk machine. It is particularly well suited for portable as well as office use.

Concord Dictating machines use the grooved magnetic disc principle, proved to be the most desirable for clarity of sound, erasability, ease of handling, and most economical cost (discs may be re-used up to 50,000 times).

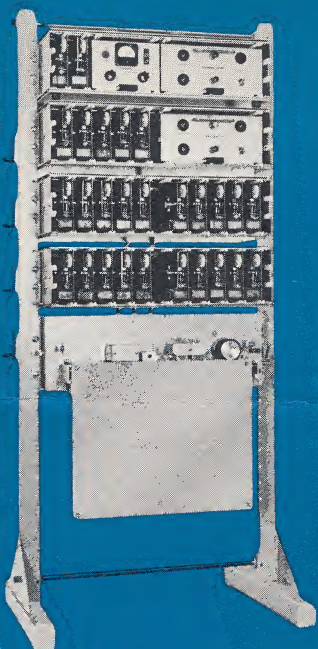
Concord has extensive experience in the field of magnetic recording, and markets a complete line of professional and home tape recorders. Concord dictating machines have been manufactured for over 15 years. More than 200,000 units are in use throughout the world.

AUTOMATIC ANNOUNCING SYSTEMS

The Concord Multitext System is a continuous duty system designed for the automatic dissemination of announcements and messages such as: advertising messages for supermarkets and department stores, airline flight information, railway stations, passenger elevators, automatic trouble detecting devices, or any system needing repetitive messages or presentation of information.

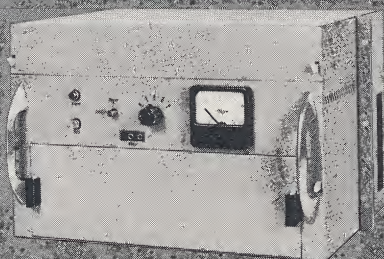
There are many factors in favor of the Concord Multitext System. Making announcements is simplified. It eliminates the factors of fatigue or absence of the announcer. It provides perfect announcements under all circumstances without variations.

The Multitext uses the magnetic recording principle for storing messages. Depending upon the type of equipment chosen, either 24 or 40 separate announcements may be selected at the push of a button. The 24 channel equipment is capable of simultaneous reproduction of all channels; the 40 channel equipment plays back a single channel at a time as selected. By combining equipment, several hundred messages may be push-button selected. Concord's Perma-phone equipment is excellent for short period text announcing, up to 20 different announcements on a grooveless magnetic disc.



AUDIO INSTRUMENTATION

Years of experience in magnetic recording techniques has opened up an entire new field in automatic remote audio instrumentation. Concord's speaking meter will automatically transmit any measured value in spoken form. These values are transmitted over telephone lines, two-wire circuit, or radio link. Applications are unlimited for Concord's speaking meter: velocity, liquid level, temperature, pressure, flow, or any measured value can now be transmitted in spoken form.

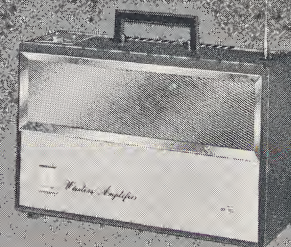


WIRELESS MICROPHONE AND AMPLIFIER

The Concord Wireless Microphone allows complete mobility and freedom of movement with no trailing wires underfoot. Applications are unlimited — for pointing out charts and graphs in auditoriums, audience participation, remote pick-ups, allowing unlimited movement for auctioneers, interviewing, teaching, taking physical inventories, sports events, at the scene pick-up, etc.

The system consists of a small all-transistorized battery operated transmitter/microphone which transmits your voice over an FM channel to the Concord receiver/amplifier.

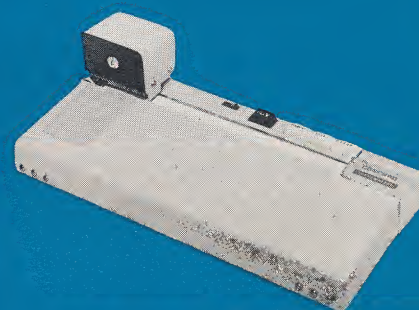
The receiver/amplifier operates from 115 volts and has sufficient audio output for small auditoriums. It will also connect to any public address system, or several Wireless Amplifiers may be used simultaneously to form a multiple unit system for larger auditoriums.



INTERWRITER

The Concord Interwriter is an instrument for the instantaneous transmission of written and oral communications. Applications are numerous: In restaurants, hotels, airlines, sales offices, and many other office uses.

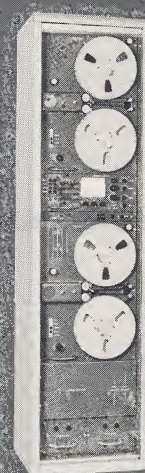
The Concord Interwriter is a self-contained, all transistorized, transmitter and receiver unit, designed for the instant transmission of written or oral information. Write the message with an ordinary pencil — it is received instantly and accurately at a distant location. Push a button and talk over the same system. The Interwriter is manufactured to the highest industrial standards. Any number of Concord Interwriters can be installed over a two-wire system.



MULTICHANNEL TAPE RECORDER

The Concord Multichannel Recorder is designed for all types of documentary audio recording. It is especially suitable for recording in air traffic control, railway traffic control, electrical power distribution, ocean navigation, police, fire and other constantly alerted communications organizations, and all types of documentary audio recording.

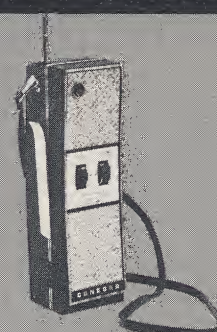
The Concord Multichannel recorder combines 10 years of experience in design and manufacture of high reliability, trouble-free, recording equipment. The equipment is compact, fully transistorized, using all plug-in printed circuits and gives up to 24 channels in one 19 inch rack.



TRANSCIVER

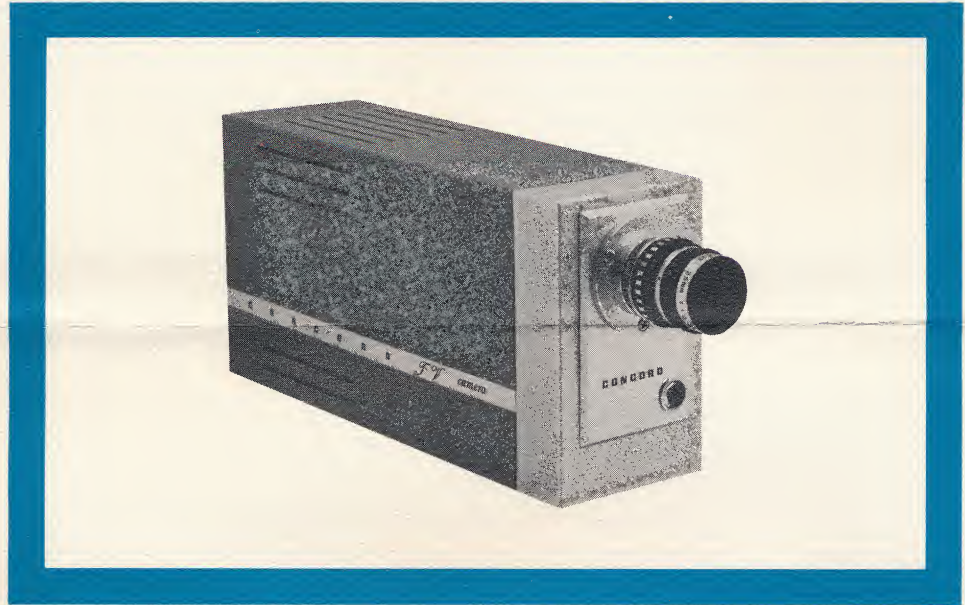
The Concord Transceiver has been expertly designed and developed to perform Walkie Talkie transmission and receptive functions quickly, precisely, and most important, with maximum reliability.

Advanced styling, ease of operation, plus many exclusive Concord engineering features, add to the variation of applications which the TG-132 Transceiver is capable of performing in a superior manner. Industrial applications, construction crews, limited geographical area communications systems, marine, expeditions, forestry, fishing and hunting . . . are but a few phases in which the Concord Transceiver will provide dependable service, and rugged long-life operation.



THE CONCORD

closed circuit television system



The Concord color ITV system multiplies and extends human vision in business, industrial and medical applications. It permits one to view widely separated scenes simultaneously; or many individuals to view, in color, the same scene at one time. It is particularly adaptable for all teaching applications such as surgical procedures, giving a surgeon's eye view in color to students and doctors, and will eventually replace the surgical amphitheatre. Test procedures — rockets, missiles, explosives can be viewed in color remotely.

The Concord Color System consists of a transistorized camera, camera control unit, and color monitor. The camera control unit gives the set-up adjustments and single color control knob; the output of the control unit operates the color monitor.

The Concord Black & White TV system consists of a self-contained camera that will feed any regular TV receiver. The camera is rugged, all solid state and designed for continuous duty industrial service.

Camera housings are available for outdoor, underwater and specific stringent environmental conditions.

For any application: teaching, testing, where it is too hot, too cold, inaccessible, or too expensive; where it is desirable to view in color, Concord ITV is the answer.



CONCORD ELECTRONICS CORP.

INDUSTRIAL PRODUCTS DIVISION

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THE KRS **DATA-STACT DR-2** PORTABLE INSTRUMENTATION RECORDER

The KRS DATA-STACT Model DR-2 Cartridge Tape Recorder operates with up to 6 magnetic tape cartridges containing endless tape loops of any length, up to 1200 ft. Each cartridge is capable of recording and reproducing up to 4 channels, or 2 standard I.R.I.G. channels on ¼-inch-wide tape.

Instrumentation Quality

The DATA-STACT DR-2 Recorder utilizes plug-in, interchangeable FM or direct-type electronics covering the frequency range of DC to 100 kc. Standard tape speeds are provided at $1\frac{5}{16}$, $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$, 15, and 30 ips. Units weigh 85 lbs. and are normally provided with handles for carrying. Rack-mounted units are also available.

Easy Tape Handling

KRS STACTape Cartridges are factory loaded with 1 mil base Mylar tape in endless-loop rolls up to 1200 ft. maximum capacity. Cartridges can be loaded and unloaded in the recorder in less than 3 seconds. Tape can be reversed for easy editing. Low tape tension and light tape load allows 50 millisecond start and stop tape operation without overshoot or tape stretch. Gentle tape handling provides from 10,000 to 35,000 tape passes over the heads without failure, allowing true **continuous** operation for the first time in a tape recorder.

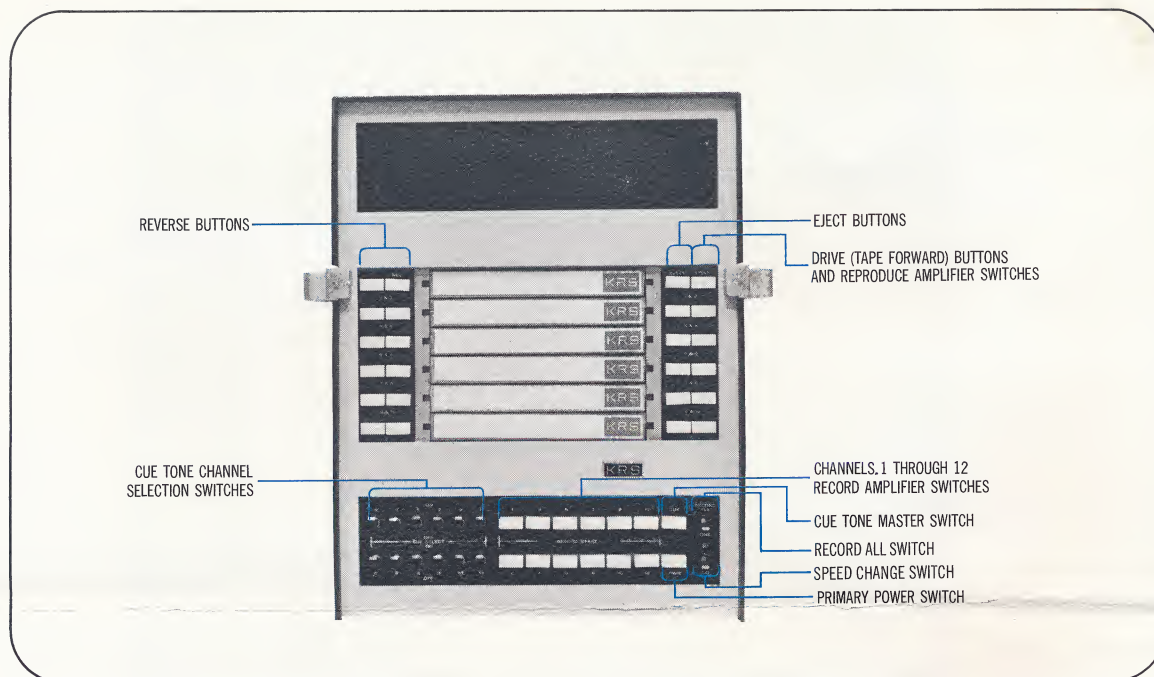
Reliable Operation

DATA-STACT DR-2 Recorders improve upon

the efficiency of reel-to-reel machines by doing away with trouble-prone spool-out motors, brakes, and associated components. A combination of static charge (on the tape) and friction during operation supplies constant holdback tension, thus freeing the tape path of flutter-producing mechanical parts. By eliminating critical reel-machine components, the designers of the DR-2 Recorder have produced an instrument that costs less to operate and maintain, and that requires no mechanical adjustments.

A single motor, driving a 3-step pulley and non-slip patented capstan, moves the tape. Tape guiding is precise, and is done in the recorder, not in the cartridge. Solid-state electronics eliminate most electronic maintenance problems. Elimination of mechanical adjustments provides a low maintenance recorder instead of a complex mechanism requiring perpetual attention by the user. This new concept in handling tape provides operating reliability previously unobtainable in tape recorders.

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INSTRUMENTATION QUALITY MULTI-CARTRIDGE RECORDERS

KRS DATA-STACT Recorders house six magnetic tape recording cartridges, all capable of double bandwidth recording, in a single portable cabinet. Equipped with six STACTape Cartridges, DATA-STACT Recorders provide more magnetic tape recording capacity per cubic foot of space than other instrumentation machines. Each cartridge may be operated independently or sequenced automatically. A patented non-slip capstan also allows simultaneous operation of all cartridges to provide 12 data channels, or 24 in a larger rack-mounted version.

UNUSUAL FLEXIBILITY

DATA-STACT units record and reproduce 2 channels of data on each cartridge, or up to 12 channels of data on all six cartridges simultaneously. Or, they may be used to record on two or more tracks simultaneously while playing back all other channels. Six ¼-inch tapes provide the capacity of 1½-inch tape width with the flexibility of being split into six tapes, each independent or synchronized with the others as desired. Plug-in interchangeable FM or Direct-type solid-state electronics handle data from D.C. to 100 kc at six selectable tape speeds. Microgap heads permit the option of recording and reproducing data at one-half the tape speed of standard bandwidth machines. Models are available with 4 channels per cartridge, for up to 24 data channels, in a rack-mounted unit.

EASY CARTRIDGE LOADING

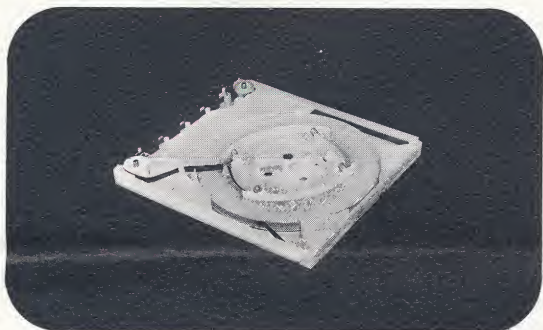
STACTape Cartridges are the only reversible continuous-loop cartridges providing from 10,000 to 35,000 tape passes before tape failure. It is never necessary to touch or thread the tape in a STACTape Cartridge as it is factory-loaded with 1-mil base instrumentation Mylar tape in any lengths up to 1200-foot endless-loop rolls. Tape direction can be reversed for ease of editing. Cartridges are easily changed in three seconds by sliding them into front-loaded guide rails. They automatically stop when a complete pass of the tape is completed, and are easy to mail or store.

SIMPLE PUSHBUTTON CONTROLS

Plainly marked backlighted pushbutton controls simplify operation. Remote Control is provided as standard through rear-panel connectors. Synchronized "start recording tone" is furnished on chosen data channels through toggle switches, and may also be used for timing signal pulses by remote control contact closure.

RELIABILITY

Each DATA-STACT Recorder uses only a hysteresis synchronous motor and a single extended non-slip patented capstan for all six tape decks. No tape spool-out motor is required and no brakes are needed, eliminating the need for any mechanical adjustments. This improves reliability and performance, allowing continuous operation for thousands of hours. All solid-state plug-in electronics require a minimum of maintenance. Tapes suffer fewer drop-outs because they are protected from handling in use or in storage. Tapes are subjected to less strain in starting or stopping, and tape overshoot is avoided due to lower tape mass, low tape tension, and the absence of heavy reel flanges. Double bandwidth recording option allows one-half the normal tape speed for additional reliability and longer life. 60 ips is no longer necessary, for example, when the same data bandwidth can be recorded at 30 ips. Control relays are long-life IBM bifurcated contact types.



STACT MULTI-CARTRIDGE SYSTEM FEATURES

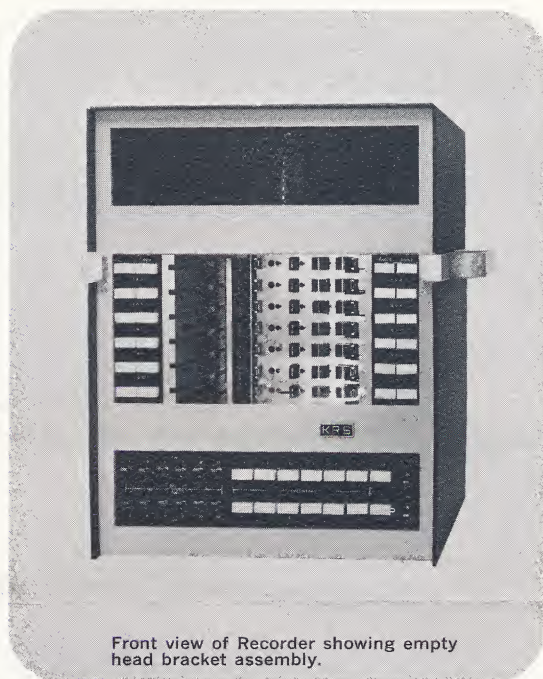
DATA-STACT systems are supplied with a choice of up to six cartridges as standard. A hysteresis synchronous motor belt-drives a single extended capstan through a three step pulley which, in turn, powers tapes in the six cartridge decks. Six speeds are selectable through a motor-speed change switch and three-step pulley. The simplicity of the tape drive unit coupled with long-life economical sleeve bearings that are easily changed in the field, insure trouble-free continuous performance without frequent maintenance.

Head-mounting brackets provide space for optional erase heads, available as accessory items. Various remote control combinations for both record and reproduce functions for each cartridge deck are provided as standard through rear-panel connectors.

Individual tape cartridges are synchronized by attaching a metal film strip to each tape. The film stops the tape and initiates automatic release of the cartridge. Individual cartridge pushbuttons control cartridges for independent operation, and a common pushbutton controls all cartridges for precise synchronized operation of all tapes as a multi-channel recorder.

A short tone burst can be recorded on the tape immediately upon start-up to further identify the starting point, or to identify events occurring at any time. This tone can be recorded manually or remotely on any number of channels by operating channel selection switches. Tapes are synchronized on all cartridges when started simultaneously by the common start button, or they can be operated independently of each other at any time. Recording and/or reproducing data simultaneously, on any combination of channels, is made simple by BNC connectors used for all inputs and outputs. Tape slippage is practically negligible due to the special capstan and low tape tension.

A unique cartridge reversing feature enables tapes to be run backwards for a few minutes running time (200 feet maximum) as an aid to editing data. Tapes are fully compatible with all ¼-inch standard (I.R.I.G.) 2 track reel-to-reel machines for 12 channel models. Tapes may be easily removed from the cartridges and wound on reels, if necessary, for data processing on reel-type machines, merely by cutting the tape loop and letting it pull out of the cartridge.



Front view of Recorder showing empty head bracket assembly.

SPECIFICATIONS MODEL DR-2

TAPE SPEEDS: Six tape speeds, $\frac{15}{16}$, $1\frac{1}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$, 15, and 30 ips are supplied as standard; other speeds available on special order.

MODELS AVAILABLE: Basic recorder model is furnished with heads and electronics as specified upon order, up to six-cartridge capability — 12 Record and 12 Reproduce amplifiers maximum. Erase feature is an optional accessory. 24 channel 6 cartridge unit is available with 4 channels per cartridge.

WOW AND FLUTTER: Less than 0.1% RMS over the range of 0 to 300 cps at $7\frac{1}{2}$ ips with standard cartridges.

CARTRIDGES: Can be loaded with any tape loop length up to 1200 feet. Normally furnished with any length load specified with or without foil stop. A 1200 foot loop provides 30 minutes recording time at $7\frac{1}{2}$ ips, or 60 minutes at $3\frac{3}{4}$ ips for each track. Cartridges are made of tough shatterproof Polystyrene plastic. Tape is instrumentation quality ¼-inch colloidal graphite lubricated, and will last for 10,000 to 35,000 passes over the heads.

ELECTRONICS: Miniature, all-solid-state on individual epoxy-glass circuit cards. FM and Direct cards are completely interchangeable in plug-in connector strips. Cards are mounted vertically with all controls accessible from the top of the machine through an easily removable cover. (See specs, rear page.)

MAGNETIC HEADS: Separate ¼-inch 2-track (or 4-track) Record and Reproduce heads; metal faced, long life, with a standard ¼-inch tape (I.R.I.G.) compatibility. Microgap Record heads are provided as standard, allowing optional double bandwidth recording and playback capability (twice standard frequency response, at all tape speeds). Heads are normally furnished to handle number of data channels initially ordered, unless otherwise requested. Tape Sensing heads are furnished as standard on all channels for end of tape (loop) sensing for automatic cartridge release. Erase heads are available as optional accessories for selective erase. Special head configurations are available (such as reproduce-erase-record).

POWER SUPPLY: Solid-state plug-in type with adjustments for both -12 V. and +12 V. levels for powering electronics. D.C. also is furnished for control solenoids, control relays, and lamps, to insure low-noise and long life.

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CUE OSCILLATOR: Plug-in card, available at 1 kc, or other optional frequency, as appropriate for range of tape speeds anticipated. Has output level control. Cue tone can be selected to record on any combination of data channels. Useful for timing, event marking, calibration, etc.

DIMENSIONS: Case is 17 inches high by 12½ inches wide by 12½ inches deep.

WEIGHT: 85 lbs., complete with full set of 12 record and 12 reproduce electronics. Cartridges, with a full tape load, weigh 15 ounces.

POWER REQUIREMENTS: 150 watts at 105 to 125 v.a.c., 60 cps. 50 cps, and D.C. models available on special order.

ACCESSORIES: An erase option can be furnished for each cartridge. This requires an erase head and an erase oscillator. The erase oscillator is capable of powering a maximum of 3 erase heads simultaneously. Erasing at speeds above 7½ ips is considered impractical. A bulk tape eraser is recommended for normal tape erasing applications, and provides a quick erase operation, erasing through the cartridge.

A Motor Drive Amplifier accessory is available for providing $\pm 0.01\%$ accurate primary 60 cps output for recorder operation where input line frequency varies (from 45 cps to 65 cps). Another model provides this same 60 cps output accuracy, utilizing D.C. input (from 24 to 28 V.D.C.).

An automatic channel sequencing unit is available for head-switching record and/or reproduce heads for automatically sequencing 1 or more channels with slight overlap between channels. One or more sets of record and/or reproduce electronics may be sequentially switched through all cartridges automatically, with this accessory.

For monitoring voice recorded channels, or other audio information, a plug-in 250 Mw solid-state audio power amplifier is available for operating into a 3.2 ohm loudspeaker.

Plug-in filter cards are available for filtering the bias oscillator frequency (approximately 500 kc) from the output of direct reproduce amplifier cards. Normally, the bias used for direct recording will appear at the output of all direct reproduce channels. When outputs are displayed on wide bandwidth visual devices (such as oscilloscopes) the bias frequency may appear as a modulation of the data frequency (normally eliminated in narrow bandwidth direct writing display devices). These simple plug-in output filters will eliminate the bias at the direct amplifier outputs, allowing clean visual presentation on wideband oscilloscopes.

TAPE SPEED ACCURACY: Accuracy depends on precision of the primary 60 cps power source. Normally, commercial power is better than 0.25%. With motor drive amplifier accessory 60 cps output accuracy is 0.01% (with 45 to 60 cps input, or 24 to 28 V.D.C. input).

ELECTRONIC SPECIFICATIONS*

DIRECT RECORDING

FREQUENCY RESPONSE RECORD/REPRODUCE:			
Tape Speed	Standard Bandwidth RMS Signal-to-Noise at 37 db. *Frequency Response	Standard Bandwidth RMS Signal-to-Noise at 41 db. *Frequency Response	Double Bandwidth RMS Signal-to-Noise at 36 db. *Frequency Response
30 ips	50-50,000 cps	300-50,000 cps	300-100,000 cps
15 ips	50-30,000 cps	300-30,000 cps	300- 50,000 cps
7½ ips	50-15,000 cps	300-15,000 cps	300- 25,000 cps
3¾ ips	50- 7,500 cps	300- 7,500 cps	300- 12,500 cps
1½ ips	50- 3,750 cps	300- 3,750 cps	300- 7,500 cps

*Plus or Minus 3 db, and referred to 1.0 Volt RMS and 1% distortion at 1000 cps.

Equalization: Plug-in module (one for each tape speed)

Bias Frequency: 500 Kc.

Total Harmonic Distortion: ... 1% at 1000 cps.

Input Level: 1 Volt RMS, unbalanced to ground, full scale

Input Impedance: 100,000 ohms.

Output Level: 1 Volt RMS across 10,000 ohms at normal recording level (1% distortion)

Output Impedance: Output is developed across 200 ohms in series with 25 mfd., unbalanced to ground. Maximum loading, 1000 ohms.

Direct Record Amplifier

Controls: Level Control; Bias Level; Distortion Adjustment.

Direct Reproduce Amplifier

Controls: Level Control; Equalization trimmer.

FM RECORDING

FREQUENCY RESPONSE RECORD/REPRODUCE:				
Tape Speed	Single Bandwidth Center Carrier Frequency	Single Bandwidth *Freq. Response	Single Bandwidth RMS Signal-to-Noise	Double Bandwidth Specifications
30 ips	27.0 Kc.	0 - 5,000 cps	35 db	Twice the frequency response shown, for any given tape speed, at approximately 2 db lower signal-to-noise ratio than for single bandwidth. Center carrier frequencies are double those for single bandwidth.
15 ips	13.5 Kc.	0 - 2,500 cps	36 db	
7½ ips	6.75 Kc.	0 - 1,250 cps	38 db	
3¾ ips	3.37 Kc.	0 - 625 cps	36 db	
1½ ips	1.68 Kc.	0 - 312 cps	35 db	

*Plus or Minus ½ db, and based upon plus or minus 40% deviation for full scale signal.

Total Harmonic Distortion: Less than 1.0%

Linearity: DC (at all tape speeds) is 0.5% of full bandwidth.

D.C. Drift: Less than 2% (overall) of full bandwidth for a change of temperature in the range 40 deg. F to 120 deg. F, following initial warm-up of several minutes, combined with a line voltage variation of 105 to 125 Volts.

Input Level: 1 Volt RMS, unbalanced to ground, full scale

Input Impedance: 20,000 ohms minimum, unbalanced to ground.

Output Level: 1 Volt across 10,000 ohms for plus or minus 40% deviation (100% Modulation)

Polarity: A positive input signal produces an increase in frequency.

FM Center Frequency Tuning

Elements and Filters: Plug-in Record Amplifier center frequency module (one for each tape speed). FM Limiter and FM Discriminator for reproduce are on separate plug-in cards. Only an FM Discriminator is required for each tape speed. (It also contains the low pass output filter for that tape speed.)

FM Record Amplifier Controls: ... Level Control; Center Frequency Trimmer; Zero Balance Trimmer

FM Discriminator Controls: Level Control; Zero Balance Trimmer; Output Filter Frequency Trimmer

*Test procedures available on request.

The KRS DATA-STACT Portable Instrumentation Recorder, like all KRS products, is a precision unit backed by a quality conscious organization. All units are guaranteed against defects in operation as a result of faulty parts or labor for a period of one year.



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